

DESCRIPTION OF A NEW WHITEFISH (COREGONUS OREGONIUS) FROM MCKENZIE RIVER, OREGON.

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In this paper the description of a new species of whitefish from McKenzie River, in Oregon, is presented.

COREGONUS OREGONIUS Jordan, and Snyder, new species.

CHISEL-MOUTH JACK.

Coregonus williamsoni JORDAN and EVERMANN, Fish. North Middle Amer., I, p. 463, 1898, in part, not of Girard.

Head 4 in length to base of caudal fin; depth 5; depth of caudal peduncle 15; eye $5\frac{1}{2}$ in head; snout $2\frac{1}{3}$; interorbital space 4; scales in lateral series 86; between lateral line and base of dorsal 9; between lateral line and base of anal 6; dorsal rays 12; anal rays 12.

Body long and slender, the caudal peduncle narrow; snout very long, the end fleshy, rounded and somewhat turned up; interorbital space broad and convex. Maxillary 4 in head, $2\frac{2}{3}$ when measured from tip of snout, its width equal to two-thirds of its length; the upper edge almost straight, the lower broadly and rather evenly curved. Lower jaw much shorter than the upper, the square anterior edge fitting beneath the overhanging upper lip; lateral edge of lower lip thin, broad, and pendent. Branchiostegals 8, broad and leaf-like. Gillrakers 6+13, short, pointed, and comparatively slender. Eye located nearer tip of snout than edge of opercle by a distance equal to half its diameter; a narrow, thin, adipose lid anteriorly. Openings of nostril separated by a valve-like partition. A row of prominent mucous tubes extending along the suborbital bones, below and behind the eye.

Scales moderate; 32 transverse rows between occiput and origin of dorsal; small scales along basal part of adipose dorsal, there being 5 or 6 rows a short distance behind its origin; a large scale above axil of ventral, the length of which is contained $2\frac{1}{4}$ times in the length of fin. Lateral line almost perfectly straight.

Origin of dorsal nearer tip of snout than base of caudal by a distance equal to length of maxillary; edge of fin concave; first ray highest, the length contained $1\frac{1}{3}$ times in head. Adipose fin of enormous size, the length of its base equal to that of anal fin; the height contained $2\frac{1}{2}$ times in the length of its base. Anal inserted opposite the adipose fin, the posterior ends of their bases being on the same vertical line; height of longest (first) ray contained $1\frac{2}{3}$ times in the head. Pectoral sharply pointed, the length contained $1\frac{2}{3}$ times in the head. Origin of ventrals below middle of dorsal, their length equal to highest dorsal ray. Caudal deeply notched, the lobes rounded $1\frac{1}{3}$ in head.

Color silvery, somewhat dusky above; edges of fins dusky.

Described from the type, Cat. No. 62987, U.S.N.M., a female specimen 480 mm. long, the largest specimen known, from the McKenzie River, Oregon, collected by Mr. A. C. Bassett, of Menlo Park, California. Many others, including the cotypes, Cat. No. 21140, Stanford University collection, were sent by H. C. MacAllister, head fish warden of the State of Oregon. The figure of the type, a female as above indicated, is drawn by Mr. William S. Atkinson.

Females ready to spawn, others with the eggs considerably smaller, and males with the reproductive organs greatly developed, are at hand. A male specimen has the body covered with tubercles, one on each scale. The snout appears to increase in length and become prominent with age. Its great length is not a character peculiar to either sex, nor is it an indication of sexual maturity. Small individuals (measuring about 250 mm.), both males and females, sexually mature, have relatively short snouts. The adipose dorsal is relatively larger in older specimens, but even in very small examples its base is nearly equal to that of the anal fin, and it is much higher than any other whitefish. The young of this species have large dark spots on the upper surface, and a series of short, broad, vertical bars along the lateral line.

The following is a table of proportional measurements:

Length (to base of caudal) in millimeters...	425	384	340	248	226
Length head, in hundredths of length.....	.25	.245	.225	.225	.215
Depth caudal peduncle062	.06	.062	.052	.056
Length snout.....	.095	.08	.075	.074	.062
Tip of snout to end of maxillary.....	.085	.08	.072	.07	.06
Snout to occiput.....	.19	.195	.175	.17	.165
Length base adipose fin.....	.13	.12	.12	.115	.105
Height of adipose fin.....	.06	.045	.055	.05	.055
Dorsal rays	12	13	13	13	12
Anal rays.....	12	12	12	12	11
Scales in the lateral line.....	86	81	85	85	84

For several summers Mr. A. C. Bassett, of Menlo Park, California, has visited the McKenzie River, in central Oregon, and has reported

the presence of a remarkable game fish there, which is locally known as the "Chisel-mouth Jack." The present writers supposed this to be the Chisel-mouth Chub, *Aerocheilus alutaceus*. At our suggestion, however, Mr. Bassett brought home a fine specimen of the game fish, and it proves to belong to the group of *Coregoninae* or white fishes. The species reaches a length of about 18 inches, is extremely swift and gamey, takes the hook readily, and is reputed to be very destructive to the spawn of salmon. After the receipt of the original specimen from Mr. Bassett we secured numerous others, also from the McKenzie River, through the courtesy of Mr. H. C. MacAllister, master fish warden of the State of Oregon. Numerous young examples were found in the collection of Stanford University, from Weiser River, at Weiser, Idaho (Coll. J. O. Snyder), and Payette River, at Payette, in Idaho (Coll. C. H. Gilbert No. 2127, Stanford University), and from Willamette River at Corvallis, Oregon (Coll. J. O. Snyder).

From a letter of Mr. Bassett dated September 15, 1908, we quote the following:

I have never looked to ascertain the contents of the stomach of the "Chisel-mouth Jack," but as the fish rises to natural and artificial flies, I presume they take about the same feed as the trout. They feed at the same time and at the same places as the Rainbow and Cut-throat Trout, and take the same artificial flies.

The river from which this fish was taken, the McKenzie, heads near the Three Sisters in Lane County, Oregon, and is the outflow from a small snow-fed lake, about 100 miles northeast of its junction with the Willamette River at Coburg. It is in the main a rapid-flowing river, but with stretches of an eighth or quarter of a mile of quieter water, well shaded with willow, cottonwoods, maples, cedars, and pines; width from 150 to 300 feet, depth 3 to 6 feet, and much deeper in the pools; cold and clear water carries besides this the Dolly Varden, Rainbow, Cut-throat Trout, Suckers, and a Lamprey.

The "Chisel-mouth Jack" or "Chisel Bill," as they are often called locally, are quite plentiful, and are persistent in rising to the natural or artificial fly, and will often strike eight or more times if not successful sooner in taking the lure. They make about the same struggle to escape that a Rainbow does. My largest capture weighed 2½ pounds, but old residents told me they had taken them weighing 4 pounds, and I think this statement can be relied on. They are a good table fish, preferred by many to the trout. The flesh when cooked is a light pink, about the same as the trout in color, but of a distinct flavor.

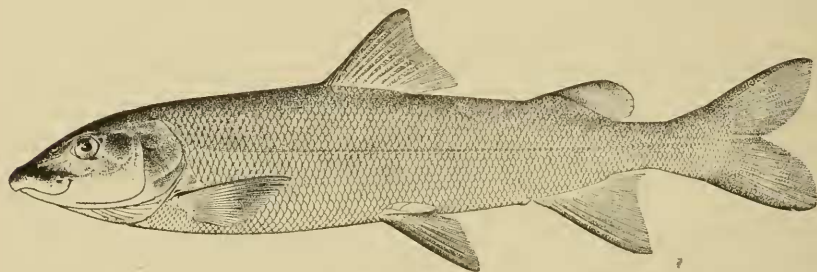
The fish when first taken shows yellowish brown above median line and white below. I presume they spawn in the small streams emptying into the McKenzie, a great number of which furnish good spawning grounds for fish, as they are brushy, cold-water, continuous flowing streams. The specimen you have was taken near Deerhorn post-office, about 30 miles up the river from Coburg.

Eugene City is the nearest point by rail to reach the McKenzie, stages running from there to Belknap and Foley Springs, 60 miles distant.

The river carries an abundance of feed, and eleven years ago, when I first visited it, was full of fine, fat, lively trout. Constant fishing by numbers of anglers from abroad, and by the loggers engaged in driving logs to the mills

near Eugene, has greatly diminished the day's catch, but the anglers at Eugene and vicinity are now fully alive to the situation, and propose to restock it. It is a beautiful stream, even grand in some of its stretches, and all along 70 of its miles of flowing through a fine canyon, a sight to delight the eyes of an angler.

The species is related to the Rocky Mountain whitefish, *Coregonus williamsoni* Girard, with which it has been hitherto confounded. From this species it differs mainly in the slender body, slenderer caudal peduncle, produced and pig-like nose, and especially in the extremely high "banner-like" adipose fin, which in old and young is far larger than in any other Salmonidæ. The description of *Coregonus williamsoni* given by Jordan and Everman^a is drawn mainly from the Chisel-mouth Jack. The fish wardens of Oregon have thus far recognized but one species of whitefish in Oregon. The essential characters of this species are those of the subgenus or genus *Prosopium*, but the long nose, and especially the very large adipose fin, separate it widely from *Coregonus quadrilateralis*, the type of



COREGONUS OREGONIUS.

Prosopium. In the size of the adipose fin, *Coregonus williamsoni* is intermediate between *quadrilateralis* and *oregonius*, though much nearer the former. The Rocky Mountain whitefish, *Coregonus williamsoni* Girard,^b is found on the Pacific slope of the Rocky Mountains in Idaho, Washington, Montana, and British Columbia, between the Rocky Mountains and the Sierra Nevadas. It is well figured by Bean^c from a male specimen from the Little Spokane River.

It is a smaller fish than the Chisel-mouth Jack, deeper in body, with snout not produced, and the adipose fin, though large and long, very much smaller than in *Coregonus oregonius*.

The figure of *Coregonus williamsoni* Girard,^d from the Des Chûtes River, represents the Rocky Mountain whitefish, and not the Chisel-mouth Jack. The form of the body, the form of the head, the moderate adipose fin and robust caudal peduncle all agree with the

^a Fishes North and Middle America, I, p. 463.

^b Proc. Acad. Nat. Sci. Philadelphia, 1856, p. 136; Des Chûtes R. Oregon.

^c Bull. U. S. Fish Commission for 1894, p. 204, pl. XXI, fig. 3.

^d U. S. Pacific R. R. Survey, 1858, p. 326, pl. LXVI.

species figured by Bean, which must be the original *Coregonus williamsoni*. Mr. Bean tells me that Girard's type-specimen is no more in existence. Though we are not sure which species exists in the Des Chûtes River, and perhaps both may be found there, we must assume that Girard's figure is correct.

We have no specimens of *Coregonus williamsoni* from the Columbia Basin, for direct comparison with *Coregonus oregonius*. Examples from Sicamous, on Shuswap Lake, British Columbia (Coll. C. H. Eigenmann), and numerous fine examples from the Truckee River, California,^a which may be considered as representatives of *C. williamsoni*, seem not to differ from each other, but agree closely with the figure and description published by Girard. They differ notably from *Coregonus oregonius* in the heavier body, deeper caudal peduncle, shorter and less pointed snout, and in having a comparatively small adipose fin, its base being only about two-thirds as long as that of the anal. One poorly preserved specimen of the form called *Coregonus cismontanus*, from Beaverhead River, Montana, appears to agree very closely with the above. Both the Beaverhead and Shuswap specimens are smaller than those from the Truckee River, and neither will serve to show slight differences if any such exist. Measurements of the specimens referred to are here given.

The types of *Coregonus cismontanus*, from Horsethief Springs, Madison River, Montana, are still smaller and less satisfactory. *Coregonus couesi* Milner, from Chief Mountain Lake, the head of the Saskatchewan, is doubtless the same as *Coregonus cismontanus*. *Coregonus couesi* and *Coregonus cismontanus* represent at the most a subspecies of *Coregonus williamsoni*, with possibly smaller adipose fin.

*F*in rays and measurements of *Coregonus williamsoni*.

Locality.	Dorsal rays.	Anal rays.	Scales, lateral line.	Scales, transverse series.	Scales before dorsal.
Truckee River.....	13	11	82	9 + 9	32
	12	11	84	8 + 9	31
Beaverhead River, Montana.....	13	11	85	8 + 9	29
Shuswap Lake, British Columbia.....	13	11	81	8 + 9	30
	13	11	83	8 + 9	33

Locality.	Head in length.	Snout in head.	Depth of body.	Depth of caudal peduncle.
Truckee River.....	4.9	3.2	5	14
	4.7	3.2	5.2	15
	4.7	3.3	4.8	14
Beaverhead River, Montana.....	4.4	3.2	4.7	13
Shuswap Lake, British Columbia.....	4.3	3.8	4.8	14.3

According to our present view, the status of the whitefishes of the Pacific slope may be expressed thus: In the Columbia River are three

^a These were collected near Floriston, California, by Mr. S. J. Mandeville.

species, one of which, *Coregonus oregonius* differs widely from the others, and is not known to be represented in any other basin. *Coregonus williamsoni* occurs also in streams to the northward of the Columbia, and in the Great Basin of Nevada. It is represented east of the divide in Montana by a slightly differentiated form, *Coregonus coyesi*,^a of the Saskatchewan, which probably includes *Coregonus cismontanus*^b of the Upper Missouri. The third species, *Coregonus coulteri* (Eigenmann, from the Upper Columbia River, Kicking Horse River at Field), of which we have specimens from Diamond Lake, Washington, is a species well-distinguished by its slender body and large scales, there being but 60 in the lateral line. Its relationships are not close to any other known species.

Farther east, this group or genus *Prosopium*, to which all these species belong, is represented by the Menominee whitefish, *Coregonus quadrilateralis*. *Prosopium* is distinguished from *Coregonus* proper by the short, few gill-rakers, the slender body, and the small, inferior mouth, above which are the large preorbitals, which Milner compared to a mask, προσώπιον.

^a Rept. U. S. Fish Commission for 1872, 1874, p. 88; Milner, Chief Mountain Lake.

^b Jordan, Bull. U. S. Fish Commission, IX, 1889, p. 49, pl. ix, fig. 89; Horse-thief Creek, Montana.